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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,306	06/01/2006	Mitsukuni Sakashita	SH-0063PCTUS	3704

21254 7590 06/22/2010

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EXAMINER	
DEHGHAN, QUEENIE S	
ART UNIT	PAPER NUMBER
1791	
MAIL DATE	DELIVERY MODE
06/22/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,306	SAKASHITA, MITSUKUNI	
	Examiner	Art Unit	
	QUEENIE DEHGHAN	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5 and 7-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5, 7-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 5, 2010 has been entered.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 5 and 7-10 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 7 and 8 recite a new limitation concerning the electric furnace. More specifically, the heat insulator in the electric furnace has an ash content of more than 100ppm. The specification offers support for a heat insulator with an ash content of less than 810ppm and even discusses the benefit of keeping the ash content lower than 810ppm. However, the specification fails to offer support as to a heat insulator with a minimum ash content of more than 100ppm. There

is no discussion in the specification as to the pertinence such a minimum and the data present in figure 6 does not demonstrate in any way that such as minimum is critical. Therefore, this limitation fails to comply with the written description requirement.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 recites the step of depositing glass fine particles on the outer surface of the core rod. However, claim 9 depends from claim 7, which recites that a glass tube is welded to the outer surface of the core rod. It is unclear how a deposition step can be performed on the surface of the core rod when a tube is welded to the surface.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious

at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claim 10 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ishida (2002/0073741). Ishida discloses a glass base material (abstract). In the event any differences can be shown for the product of the product-by-process claim 10, as opposed to the product taught by the reference of Ishida, such differences would have been obvious to one of ordinary skill in the art as a routine modification of the product in the absence of a showing of unexpected results. The product in the product-by-process claim 10 is the same as or obvious from a product of the prior art. See In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

2. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida (2002/0073741) in view of Nunome et al (2003/0110811), Chang et al. (EP 1 104 891), Kudo et al. (JP Abstract 2000-086265), and deFouw et al. (6,474,109). Ishida discloses a method for manufacturing glass base material comprising forming porous preform comprising a Germanium doped core and an inner silica clad layer surrounding the core and having a lower refractive index than the core ([0034]-[0036]), vitrifying the porous preform into transparent glass ingot that is 80mm in diameter ([0044]), heating and elongating the ingot in an axial direction in an electric furnace into a core rod ([0046]), forming an outer clad layer surrounding the core rod by depositing on the outer surface of the rod to form a porous glass body ([0051]-[0053]), and vitrifying the porous glass body into a transparent glass body ([0061]).

3. Ishida discloses fabricating a porous core rod having a ratio of the outer diameter (d) of the core to the outer diameter (D) of the first cladding of D/d ≥ 4.0 (abstract), which the equivalent of a d/D ratio of 0.25. Ishida emphasizes having a greater D/d ratio in order to ensure low OH group concentration in the core for the reduction in transmission loss of the optical fiber ([0068]). Nunome similarly teaches fabricating a preform comprising a core, a first cladding with a lower refractive index than the core and a second cladding, wherein the value of D/d is > 4.8, which is smaller than a d/D of 0.21 ([0013]). Nunome has demonstrated such a ratio allows for low OH concentration in the core resulting in low transmission loss in the optical fiber ([0022]). Ishida teaches the ratio should be at least 4.0 and the greater the D/d ratio, the less OH groups would diffuse to the core ([0066]). Accordingly it would have been obvious to one of ordinary skill in the art at the time of the invention to have made the glass body of Ishida to have a D/d ratio of >4.8 in order to minimize the OH diffusion into the core and prevent transmission losses in the optical fiber.

4. Ishida also teaches applying a second cladding on the core rod, but does not teach a rod in tube method. Chang teaches forming a porous glass material comprising a core part doped with germanium and an inner clad layer that has a lower refractive index than the core part surrounding the core ([0021]), transforming the porous glass material into a transparent glass ingot ([0024]), heating and elongating the core ingot in an axial direction to make a core rod ([0025]) and forming a outer clad layer by welding a glass tube on the surface of the core rod ([0034]). Chang teaches the rod in tube method is a well known to forming an outer clad layer on a core rod while reducing cost

(0031]). However, Chang teaches an awareness to use a glass tube with the proper purity level depending on the D/d ratio of the core rod, in order to ensure minimizing OH contamination of the core ([0022], [0031]). It would have been obvious to one of ordinary skill in the art at the time of the invention to have welded a glass tube as a well known alternative way for forming an outer clad layer on the core rod of Ishida as it is expected to achieve the predictable result of obtaining a preform with the necessary cladding layer and a low OH diffusion into the core, as demonstrated by Chang.

5. Ishida teaches using an electric furnace but does not specify a heat insulator. Kudo teaches a furnace for heating a porous preform, wherein a heat insulator for the electric furnace comprises carbon material containing less than 810ppm ash (abstract). Kudo teaches by minimizing the ash content of the parts of the electric furnace in which an optical fiber preform is heated, then ash contamination of the preform is also inhibited, especially in the core and clad portion in the vicinity of the core, thereby reducing transmission loss. Similarly deFouw teaches an electric furnace for heating an optical fiber preform comprising muffle tubes made with a carbon material with an ash content of 200ppm or less is well known in the art (col. 3 lines 38-41). Although the different parts of the electric furnace have been noted for their ash content, one skilled in the art would similarly apply the ash content to all the parts of the electric furnace, including the heat insulator so as to minimize ash contamination of the preform. Accordingly it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a heat insulator with a carbon material containing about 200ppm of ash in the electric furnace of Ishida in order to prevent impurities from

entering the preform from the heating furnace, especially since a core ingot is being produced, as taught by Kudo.

6. Regarding claim 5, Ishida teaches elongating the core ingot to a core rod with a diameter of 36mm and a ratio D/d of greater than 4.0, i.e. 4.1 ([0013], [0047]). Since D is 36, then d is 9, which means the thickness of the inner clad layer is greater than 1mm.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida (2002/0073741) in view of Nunome et al (2003/0110811), Kudo et al. (JP Abstract 2000-086265), and deFouw et al. (6,474,109). Ishida discloses a method for manufacturing glass base material comprising forming porous preform comprising a Germanium doped core and an inner silica clad layer surrounding the core and having a lower refractive index than the core ([0034]-[0036]), vitrifying the porous preform into transparent glass ingot that is 80mm in diameter ([0044]), heating and elongating the ingot in an axial direction in an electric furnace into a core rod ([0046]), forming an outer clad layer surrounding the core rod by depositing glass fine particles on the outer surface of the core rod to form a porous glass body ([0051]-[0053]), and vitrifying the porous glass body into a transparent glass body ([0061]).

8. Ishida discloses fabricating a porous core rod having a ratio of the outer diameter (d) of the core to the outer diameter (D) of the first cladding of $D/d \geq 4.0$ (abstract), which the equivalent of a d/D ratio of 0.25. Ishida emphasizes having a greater D/d ratio in order to ensure low OH group concentration in the core for the reduction in transmission loss of the optical fiber ([0068]). Nunome similarly teaches fabricating a

preform comprising a core, a first cladding with a lower refractive index than the core and a second cladding, wherein the value of D/d is > 4.8, which is smaller than a d/D of 0.21 ([0013]). Nunome has demonstrated such a ratio allows for low OH concentration in the core resulting in low transmission loss in the optical fiber ([0022]). Ishida teaches the ratio should be at least 4.0 and the greater the D/d ratio, the less OH groups would diffuse to the core ([0066]). Accordingly it would have been obvious to one of ordinary skill in the art at the time of the invention to have made the glass body of Ishida to have a D/d ratio of >4.8 in order to minimize the OH diffusion into the core and prevent transmission losses in the optical fiber.

9. Ishida teaches using an electric furnace but does not specify a heat insulator. Kudo teaches a furnace for heating a porous preform, wherein a heat insulator for the electric furnace comprises carbon material containing less than 810ppm ash (abstract). Kudo teaches by minimizing the ash content of the parts of the electric furnace in which an optical fiber preform is heated, then ash contamination of the preform is also inhibited, especially in the core and clad portion in the vicinity of the core, thereby reducing transmission loss. Similarly deFouw teaches an electric furnace for heating an optical fiber preform comprising muffle tubes made with a carbon material with an ash content of 200ppm or less is well known in the art (col. 3 lines 38-41). Although the different parts of the electric furnace have been noted for their ash content, one skilled in the art would similarly apply the ash content to all the parts of the electric furnace, including the heat insulator so as to minimize ash contamination of the preform. Accordingly it would have been obvious to one of ordinary skill in the art at the time of

the invention to have utilized a heat insulator with a carbon material containing about 200ppm of ash in the electric furnace of Ishida in order to prevent impurities from entering the preform from the heating furnace, especially since a core ingot is being produced, as taught by Kudo.

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida (2002/0073741) in view of Nunome et al (2003/0110811), Chang et al. (EP 1 104 891), Kudo et al. (JP Abstract 2000-086265), and deFouw et al. (6,474,109), as applied to claim 7 above, in further view of Hirano et al. (2003/0145630). As mentioned above Ishida discloses a core rod that has been elongated, the deposition of glass fine particles on the rod to form a porous glass body, and vitrifying the porous body into a transparent glass ([0051]-[0053], [0061]). However, Ishida does not teach an etching step. Hirano teaches etching the outer surface of the core rod with fluorine prior to adding an outer clad layer ([0187]). Like Ishida, Hirano is also concerned with OH diffusion into the core. It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the etching of the core rod step in the method of Ishida in order to remove OH impurities that had adhered to core rod during processing prior to adding an outer cladding.

Response to Arguments

11. Applicant's arguments with respect to claims 7 and 8 have been considered but are moot in view of the new ground(s) of rejection.

12. In regards to Kudo, the applicant argues Kudo teaches an ash content of less than or equal to 100ppm in a heat insulator used in a dehydrating or sintering step and

not for heating and elongating the core ingot. Although the furnace of Kudo is used for dehydrating/sintering a preform, it still teaches the importance of minimizing the ash content of a heat insulator in an electric furnace used for optical preforms. An electric furnace used for heating a preform, where to dehydrate, sinter, or elongate the preform would benefit from a heat insulator with a low ash content so as to not contaminate the preform that it is heating, regardless of the actual treatment. Even more so, since Ishida uses the electric furnace to heat a "core" ingot, it would most pertinent to apply a low ash content to the furnace of Ishida since it is handling a core, where impurity contamination is most sensitive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUEENIE DEHGHAN whose telephone number is (571)272-8209. The examiner can normally be reached on Monday through Friday 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Queenie Dehghan/

Examiner, Art Unit 1791